Article

The Change in Students' Attitude towards Favourable and Unfavourable Factors of Online Learning Environments

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Abstract: This article aims to present the results of a study on favourable and unfavourable factors of using online learning environments in the study process as a digital learning strategy to promote education for sustainable development. Technologies have changed traditional face-to-face classrooms through online environments to hybrid learning spaces. Personal experiences and expectations are part of these hybrid learning setups and learner-positive attitudes to such sessions could contribute to the effectiveness of hybrid learning and student satisfaction. The quasi-experiment was carried out to determine the attitude of students towards favourable and unfavourable factors of using an online learning environment (OLE) in the study process. Five groups of students studied for one semester using the flipped classroom method. The sample was made up of 106 secondary school students, selected by means of non-probability sampling. Students were given pre-test and post-test questionnaires in the beginning and at the end of the semester. Favourable factors of using an online learning environment identified by students in the beginning of the quasi-experiment were grouped in five categories: material resources/base; teacher personality; student personality, information presentation and increase of accessibility at the institutional level. As students gain more experience in using an OLE for learning, it is not technical issues and computer literacy that become important, but students' and teachers' attitudes and the motivation to improve and learn. At the end of the project, the participants emphasised other favourable factors: continuous uploading of materials, convenience of use and the promotion of online learning environments for studies in all subjects. The role of the teacher while using an online learning environment was highlighted. This research contributes to the improvement of teacher pedagogical competences, creating conditions for increasing student satisfaction.

Keywords: e-learning; online learning environment; ubiquitous learning; flipped classroom; student-teacher communication; ICT

1. Introduction

Information and Communication Technologies (ICTs) have become an integral part of our lives. Although none of the 17 Sustainable Development Goals particularly refers to Information and Communication Technologies (ICTs), and only several targets mention ICTs and relevant technologies, the 2030 Agenda for Sustainable Development still claims that ICTs can substantially accelerate the development progress of human beings, and may greatly bridge the digital gaps, so as to construct knowledge communities [1]. ICTs are widely used in education, and they constitute one of the main media tools for the communication and education of millennials. Today, digitally fluent and competitive generations are known as digital natives, as these individuals grow up with information

and communication technologies (ICT) that they use to experience different activities [2]. Millennials (born between 1980 and 2000) use the web to create their own content, collaborate with others and build communities. They inquire, discuss, argue, critique, investigate, seek and inform. The representatives of this generation search for information rather than simply looking at it [2]. Millennials possess a hands-on approach, communicate via media rather than directly and prefer instant responding or feedback. They want to have the possibility of distance learning if they are not able to attend a class [3].

Nowadays, educators can deliver knowledge to students more conveniently using the Internet and media-rich Web applications, compared with the conventional classroom-based approaches performed face-to-face [4]. Technologies have changed traditional face-to-face classrooms through online environments to hybrid learning spaces [5,6]. A hybrid learning space can be defined as a space where course content is delivered using a combination of conventional seminars and electronic communication tools [5,7,8]. Hybrid learning spaces merge physical and virtual environments, where online learners, offline learners and teachers can communicate with each other and the course content can be delivered synchronously and asynchronously by using digital tools and mimicking real-time communication [9]. The terms "blended learning", "hybrid learning" and "mixed learning" are used interchangeably in the literature sources [10,11] and represent the combination of physical and virtual environments where learners and instructors can interact with each other by using digital tools [12]. In 2012, the flipped classroom methodological approach was introduced by J. Bergmann and A. Sams (2012) [13]. The methodology provides students with the possibility of accessing online audio-visual materials and learning content developed by teachers, allowing them to customise their learning at their own pace [13]. Numerous studies confirm the efficiency of this method in different stages of education [14–17].

It is noteworthy that a big variety of terms is used to describe learning spaces and e-learning tools. However, there is still a lack of definitions of e-learning terminology and the criteria that distinguish them [18,19]. The term ubiquitous learning environment has been recently introduced to describe the use of various e-learning tools like Wikipedia, MOODLE, Web 2.0, Web 3.0, Blackboard and other media [20]. Descriptions of ubiquitous learning environments are broad and vary widely between studies [19,21]. A ubiquitous learning environment is seen as one where students can receive instructions, notifications and recommendations [22], or as an adoption of ubiquitous computing when creating constantly available learning activities [23], or as a specific implication of mobile learning [24]. However, the existing concept can be slightly confusing when mixed with mobile, seamless and augmented learning, which have all been employed as synonyms of the ubiquitous learning phenomenon [19].

The use of ubiquitous distant tools or hybrid learning spaces can be a driving force for the development of a sustainable world because of their global use and reach. Online learning tools help in establishing an effortless interaction between authentic and digital learning resources and at the same time offer personalised learning opportunities. Compared to fully face-to-face learning, e-learning involves lower educational costs and is considered to be more effective and time-saving [20,25]. Positive impacts could be seen in terms of usefulness and student satisfaction. Several studies confirm that learners show an appreciation of e-learning, blended learning and the use of media in the learning process [26]. E-learning improves their understanding of the course material [27] and saves time by allowing for the adjustment of study time, space and pace [28]. However, the study of Marriot, Marriot and Selwyn [29] revealed that the students' preference for online sessions was only insofar as it complemented the traditional face-to-face learning. The face-to-face preference was found in several other studies as well [30,31]. Beard, Harper and Riley [30] indicated that the teacher's presence in face-to-face sessions lessens the psychological distance between them and the learners and leads to better learning. This is because there are verbal aspects like giving praise, soliciting viewpoints, humour as well as non-verbal expressions like eye contact, facial expressions and gestures which brings teachers psychologically closer to learners [32]. Thus, the use of online learning environments has increased the importance of the teacher/professor, who is at the same time an instructor as well as a

mentor and counsellor. Furthermore, studies claim that the role of instructors in e-learning is still more prominent than the new technologies [33–35].

The new technologies as well as new methods have brought additional challenges and burdens to teachers when they participate in such a complex education system, equipped with technological opportunities. Personal experiences and expectations are part of these hybrid learning setups and learner-positive attitudes to such sessions could contribute to the effectiveness of hybrid learning and student satisfaction. It takes extra effort and time for the teachers to arrange effective online learning for the students. However, students are sometimes unsatisfied with their learning. They lack an understanding of the limitations and weaknesses of e-learning, and some may have unreasonable expectations [20]. The students' expectations towards hybrid learning as well as satisfaction prediction are also rarely investigated [25]. Several studies have been carried out on the effectiveness of the use of an online learning environment [36,37], but students' attitude towards interferences with this use have been underresearched. These factors do not encourage teachers to go on using an online learning environment as a part of their regular studies.

There is a gap in the research literature specifically devoted to the empirically and theoretically driven investigations of the online learning environment integration into the regular study process. The aim of this research is to reveal the students' attitude to the favourable and unfavourable factors and its transformation in the study process through the application of online learning environments (hereinafter—OLE) in the course of the pedagogical project. An online learning environment is the space where social and cultural processes occur in their own right, encompassing not only the visible interactions but also a range of activities that also include invisible factors mediated by background technologies, institutional policies and practices, as well as wider discourses on online learning [38]. Online learning is described by most authors as access to learning experiences via the use of some technologies [39–41]. T.C. Reeves et al. [39] clearly separate online learning from distance learning, while *Xiao* et al. [25] connect it to hybrid learning.

In this study, the students' approach to the favourable factors and the interferences in the learning process between teacher and student when using numerous e-learning resources is analysed. The flipped classroom method was used to combine face-to-face learning with the activities outside the classroom.

This study was carried out to fill the existing research gap so as to extend the frontier of knowledge in order to improve the teacher–student communication and to prepare students for the use of online learning environments.

The knowledge about students' expectations towards online learning environments before and after their experience will contribute to the proper communication of the teacher. Teachers' knowledge of what to communicate to their students before they start using hybrid learning will help students and teachers to avoid underestimating the effectiveness of the benefits of using an online learning environment and misunderstanding teacher-student communication.

The research problem is formulated as the following question: what is the attitude of students to the favourable and unfavourable factors of using an online learning environment in the study process, and how did that attitude change in the course of the pedagogical project?

2. Materials and Methods

The pedagogical project's quasi-experiment was carried out in the study year 2018–2019. The idea of the pedagogical project was to substitute the regular study resources for students by an online learning environment resources and to use it as a hybrid learning space. A hybrid learning space is a learning space where online and face-to-face instructions are integrated, with a substantial amount of "seat time" in the traditional classroom substituted with internet-based activities [10]. The goal of the project was to identify and to describe how students' perceptions of the favourable and unfavourable factors of the online learning environment use changed in the course of the project. The pedagogical project was carried out in one of the universities of Vilnius, in Lithuania. The research design was

of a quasi-experimental type, with 5 groups of third-year undergraduate students of social sciences who were given pre-test and post-test open-ended questionnaires. The qualitative research approach was chosen to evaluate the project-experiment. *Non-probability* convenience sampling [42,43] was used in this study to perform the pedagogical project's quasi-experiment. Since this was an experimental study, it did not require a large volume of participants, unlike studies [44]. A total of 106 students with ages between 19 and 21 participated in the project: 85 Lithuanian, 12 Russian and 9 Polish. There were 32 male participants and 62 female ones in the project. All the students agreed to take part in the project voluntarily. During the implementation of the project, it was agreed with the university administration and the students that, due to ethical considerations, the name of the university and study programmes would not be provided in the manuscript. All the students-participants in the project-experiment had used some OLE resources before its start, i.e., they had accumulated as much experience in OLE as usual, using the OLE for every study subject learned at the university.

The module for the quasi-experiment consisted of 160 academic hours: 30 academic hours of theoretical lectures, 30 academic hours of seminars, 5 academic hours of individual consulting and 95 academic hours of independent work. The duration of the module was one semester (16 weeks). Students had 2 academic hours of theoretical contact lectures, 2 academic hours of seminars a week and consultations on request. Paper textbooks and other material sources of information were substituted by online information sources, learning platforms, applications, etc., during the project. An independent work task had been created for the project, with targeted links to e-learning material and open information sources in the Moodle learning platform. 197 target links were provided on the Moodle platform, but other virtual sources found individually could also be freely used. The "flipped classroom" method was used during the studies to combine the face-to-face learning with the activities outside the classroom. During independent work, students analysed visual, audio and textual information on a given topic. During the seminars, group work was organised, active learning tasks were performed and the sources of information used were reflected on. During the lectures, the lecturer summarised the topic, emphasising the most important subtopics, explaining the mistakes made during the students' seminars and discussing the sources of virtual information: usefulness, reliability, informativeness, visibility, etc. Student reflection was encouraged throughout the project. The online learning environment was designed to be student-centred, flexible and dynamic, to promote interactive competence and to provide opportunities for students to share their own understandings, interpretations and perspectives of the subject matter with their peers and tutors.

The questionnaires were provided to the students at the beginning (September) and end (December) of the pedagogical project. The students were asked to answer the open-ended question: what favourable and unfavourable factors of using an online learning environment in the study process can you identify? The students were asked to elaborate on the answer to the question and to think of all the aspects of the factors that influence online learning.

The content analysis approach was applied to analyse the data [45]. The inductive content analysis was accomplished by reading through the transcripts, adding marginal notes and assigning preliminary codes. The subcategories and categories were identified [45,46]. The qualitative content analysis was carried out first and after the subcategories and categories were counted, in order to more fully demonstrate the importance of the favourable and unfavourable factors of online learning [47,48]. Although the results obtained at the beginning of the project were slightly similar in their categories to the results received at the end of the project, there were clear differences in how students treated the importance of certain factors. The results became clearer [49] when the subcategories, categories and themes were calculated.

The variation-based generalisation was used to describe the findings. The categories were not derived from an explicit theory, but were the results of interpretative descriptions of the collected material [50,51]. The findings will act as a vehicle for generalisation to other cases of online learning environment studies [42].

3. Results

The research data show that the responses collected in the beginning of the educational project can be divided into five categories that characterise favourable factors of using online learning environment: material resources/base, teacher personality, student personality, information presentation and increase of accessibility at the institutional level. Four categories coincided in the beginning of the educational project and at the end, but in the beginning the students stressed the importance of increasing the accessibility of OLE at the institutional level, which was not referred to at the end of the project. At the end of the project the participants pointed out that the very conditions of using OLE were the most important to them.

In the beginning of the educational project, students referred to material resources as the most significant ones (36): "the only condition—computers and internet", "the most important thing—working computers and the internet in the classroom", "solid material base". The personal characteristics of students also turned out to be important to them: individual practical preparation, willingness, enthusiasm and motivation. According to the students, the favourable factors of using OLE also include the teachers' willingness to use OLE (13) and the teachers' practical ability to use this environment (11). Although not all the students find it relevant, the increase of accessibility of OLE at the institutional level was mentioned as a favourable factor of OLE: "preparatory instructions for teachers and students are necessary" as well as a well-defined accountability of teachers to the administration and accountability of students to teachers: "it is necessary to account for using or not using OLE".

The (non-)use of technologies is empowered by the teacher, who can emphasise or reduce the relevance of information. The participants in the educational project distinguished the importance of the personality of both the student and the teacher as a factor that has a favourable influence on using OLE in the study process, both in the beginning and at the end of the project. It is interesting that in the beginning of the project the category of student personality had more respondents (28) than at the end of the project (23). The significance of the category of teacher personality remained almost the same in the beginning (24) and at the end (23) (Table 1).

Table 1. The distribution of favourable factors of students' attitude towards using an online learning environment (OLE) in the study process.

Beginning of Educational Project		End of Educational Project	
Category	Subcategory	Category	Subcategory
1. Material resources/base (36)	Technical resources possessed by an individual and university (29)	1. Conditions of using OLE (47)	Continuous uploading of materials to OLE and its use for learning all the study subjects (17)
	Software (5)		Convenience of use (11)
			Accessibility Simple logging in (9)
	Allocated finances (2)		Favourable conditions (8)
			Promotion of using OLE (2)
			Clarity of use (1)

Table 1. *Cont.*

Beginning of Educational Project		End of Educational Project	
Category	**Subcategory**	**Category**	**Subcategory**
2. Student personality (28)	Individual practical preparation (11)	2a. Student personality (23)	Student, motivation, interest (11)
	Motivation, willingness, enthusiasm (9)		Individual aspirations, goals set by a student (9)
	Individual goals (4)		Time planning (3)
	Presence of all conditions (4)		
3a. Teacher personality (24)	Teachers' willingness to use OLE (13)	2b. Teacher personality (23)	Teachers' internal disposition—willingness to work with OLE (21)
	Teachers' practical ability to use OLE (11)		Teachers' ability to work with OLE (2)
3b. Information presentation (24)	Clarity of information (6)	3. Material resources/base (22)	Good technical resources of an individual and university (13)
	Conciseness of information (6)		Well-functioning internet (9)
	Accuracy of information (4)		
	Systemisation of information (4)		
	Updating of information (4)		
4. Increase of accessibility at the institutional level (16)	Instructions for OLE users (9)	4. Information presentation (16)	Variety (7)
	Instructions to teachers about OLE (5)		Information presented in an interesting way (4)
	Accountability of both teachers and students (2)		Possibility of selecting information (3)
			Abundance (2)

In the beginning of the educational project, the students referred to conditions of OLE use as the most significant factor of using OLE: use of OLE for all the study subjects and not only for the project-related ones (17), convenience of use (11), accessibility (9), presence of favourable conditions (8), promotions of OLE use (2) and clarity of use (1). The importance of material resources is in the third place. After one semester of practical use of OLE in the study process, the students' attitude slightly changed. In the beginning, the students stated that the material resources of the university in general were important, whereas at the end they mentioned the conditions of OLE use. According to them, seeking the usefulness of OLE, the *"collaboration of teachers and students is necessary as well as their active engagement"*, and the students expect *"more assignments on OLE"* and the promotion of a *"more active use of OLE and provision of relevant information"*. The use of OLE starts with elementary information: *"a student has to know where to go and how to log in"*. Moreover, *"a student has to have an access"*. The students pointed out that it is necessary not to change the procedure of logging in OLE or even *"to eliminate passwords"*. At the end of the educational project there were no students stating that control promotes the use of OLE. It was noticed that all the students-participants in the educational project had used various OLE and such a learning tool was not new to them. However, the research

results disclosed that the intensive use of OLE during the educational project resulted in changes in their attitude towards favourable factors of using OLE.

At the end of the educational project the same subcategories were distinguished in the students' responses, but more students chose the internal attitudes of teachers, i.e., their willingness to use OLE (21), and only two of them mentioned the teacher's ability to use OLE (2). *"Teachers' willingness to work on OLE"* and *"teachers' willingness to upload materials to Moodle"* became relevant. It is obvious that students' limited experience results in higher requirements to the educator as a user of technologies: *"teachers' abilities to work on OLE"*, *"teachers' willingness and abilities to present information on Moodle"*, *"the most important thing is for teachers to upload information on time for students to be able to properly prepare for classes"*.

The students' responses about obstacles to using OLE in the study process were divided into four categories: student personality, teacher personality, organisational weaknesses and characteristics of information (Table 2). In the beginning of the educational project, the category of student personality (60) was seen as the main obstacle to using OLE. The aforesaid category consisted of the following subcategories: internal attitudes—passivity, lack of motivation (28), excessive workload (10) and time planning (7). According to the participants, the students' internal attitudes are the biggest barrier to using OLE in the study process: *"lack of motivation"*, *"students' passiveness"*, *"unwillingness to use OLE"*, *"laziness sometimes"* and lack of desire to change the current situation: *"habit of getting all the information in the paper"*. Some students in the research did not point out any barriers to using OLE (15). It can be stated that the participants assumed that the biggest responsibility for an insufficiently successful use of OLE was theirs. The number of students who indicated the teacher's personality as an obstacle decreased twice (32). The latter category was divided into three subcategories: unwillingness of teacher to use OLE (18), outdated attitude of teacher (7) and incapability of teacher to use OLE (7) (Table 2). The research participants thought that the teachers themselves did not want to introduce OLE in the study process or *"do not make students used to working with OLE"*. One participant reflected: *"I personally do not use much of OLE, although I am a third-year student"*.

Table 2. The distribution of students' attitude towards obstacles to using OLE in the study process.

Beginning of Educational Project		End of Educational Project	
Category	**Subcategory**	**Category**	**Subcategory**
1. Student personality (60)	Internal attitudes of student—passivity, lack of motivation (28)	1. Organizational weaknesses (40)	Lack of appropriate computers (13)
			Internet disruptions (10)
	No disruptions are identified (15)		Too little instruction to students (6)
			Logging problems (5)
	Excessive workload (10)		Insufficient financing (3)
	Time planning (7)		Lack of software (3)
2. Teacher personality (32)	Unwillingness of teacher to use OLE (18)	2. Teacher personality (36)	Internal attitudes of teacher—unwillingness to use OLE (19)
	Outdated attitude of teacher (7)		Teacher's activity in uploading materials to OLE (10)
	Incapability of teacher to use OLE (7)		Incapability of teacher to use OLE (7)

Table 2. *Cont.*

Beginning of Educational Project		End of Educational Project	
Category	Subcategory	Category	Subcategory
3. Organizational weaknesses (25)	Unavailability of internet and its interruptions (13)	3. Student personality (32)	Unwillingness of student to use OLE (11)
	Accessibility (5)		No disruptions (8)
	Financial resources (3)		Insufficient ability of student to use OLE (7)
			Time planning (6)
4. Characteristics of information (22)	Absence of attractiveness (6)	4. Characteristics of information (23)	Uninteresting presentation (8)
	Delayed uploading of material to OLE (5)		Abundance—too much information (5)
	Documents of different format (5)		Advantage of contact lectures (3)
	Shortage of information in OLE (3)		Language barriers—lack of information in the Lithuanian language (3)
	OLE cannot replace the teacher, face-to-face classes (3)		Over-simplicity (2)
			Irrelevance (2)

At the end of the educational project, the students' opinions changed. The organisational weaknesses were referred to as the main obstacles to using OLE. The students indicated internet disruptions, accessibility of OLE and financial resources. The category of organisational weaknesses was singled out (40), which consisted of the following subcategories: lack of proper equipment (13), internet disruptions (10), too little instruction to students (6), problems with logging in (5), insufficient financing (3) and lack of software (3) (Table 2). The second most important category was the teacher's personality (36) (unwillingness to use OLE, not many teacher's activities supplementing OLE resources). The third most relevant category was student personality (32). It should be mentioned that the importance of student personality as an obstacle to successful use of OLE decreased twice. The teacher's unwillingness to use OLE was seen as a significant obstacle: *"teachers avoid OLE"*, *"not all the teachers tend to improve"*, *"it is not relevant to all the teachers because it is easier to choose other ways,* e.g., *sending slides* via *e-mail"*, *"not all the teachers upload materials to OLE and not all of them use this program, more knowledge how to use this program is needed"*.

4. Discussion

The use of hybrid learning environments and the application of the flipped classroom method, as in quasi-experiment, are widely used to help students get more satisfaction with their studies and results. The conclusions can be drawn considering only the context in which the study was carried out. However, it can give some insights into the further development of the research in the area, especially in student-teacher communication. The study demonstrates some important issues in the learning process of the students using OLE.

The favourable and unfavourable factors in the beginning of the quasi-experiment were slightly different from the factors identified by the students at the end of the experiment. Students indicated technical resources possessed by an individual and the university as a favourable factor for using OLE in the beginning of the quasi-experiment. This concern can be explained by the findings of other scholars, indicating that the flipped classroom methodology can cause problems with students who have difficulties in accessibility, in the use of learning platforms or in the availability of technological tools [16]. Teachers should be aware of that before their module, to ensure that their students have

technical access to OLE. At the end of the quasi-experiment most of the students referred to the indicated conditions of using OLE as the favourable factors: continuous uploading of materials to OLE and its use for learning all the study subjects, accessibility and convenience of use. After active use of OLE, the students started to attach less importance to the material resources of the institution (technical resources, software). However, they emphasised such organisational issues as access, internet connection disturbances and technical problems. Working with unexperienced students, teachers have to take care of organisational troubleshooting, to continuously instruct students and to make online content as accessible as possible. Teachers have to ascertain if appropriate computer equipment is available at university and in the students' home and if the internet connection is good. Other studies also suggest providing appropriate instant support in class [17]. Thus, introducing students to OLE, the teacher has to allocate time to students' practical preparation to help them get ready for searching and using information.

Intensive practical experience in using OLE proves that any external disturbances can be coped with if intrinsic motivation is possessed. More students of the quasi-experiment indicated a personal impact and motivation as a favourable factor of using OLE. After the interview with 18 flipped classroom instructors, T. Long, J. Commins and M. Wough (2017) indicated that students might not be prepared for the class, so proper motivation needs to be provided [17]. It was also revealed that the use of the flipped classroom in the educational field leads to improvements in motivation [52–54]. At the end of our project, fewer students indicated their unwillingness to use OLE as an unfavourable factor. Therefore, before the study period, teachers have to discuss with students the challenges related to their time planning, to emphasise students' responsibility and self-motivation, to warn students about the problems that will be less important at the end of the course. Teachers should remember to devote some attention to students' internal disposition, to formulate expectations in an appropriate way, to warn students about possible disturbances and to teach them to cope with them.

We found out that the teacher's personality and motivation, positive attitude towards OLE and willingness to use OLE were important in the beginning and at the end of the experiment. Numerous studies indicate the prominent role of teachers in hybrid learning or using "flipped classroom" methodology [33–35]. Studies claim that the role of teachers in e-learning is more important than that of the new technologies [25–27]. The use of OLE in the flipped classroom method gives confidence to teachers and thereby encourages them to launch new ways of transmitting knowledge, reducing the traditional practices focused on the simple exposure of content through masterful lessons that fail to attract or motivate students, which cause apathy and increase the negative effects [15,54–56]. The use of OLE in a flipped classroom as a student activation method promotes learning to learn [57]. In the beginning of the quasi-experiment, many students mentioned the teacher's control as a favourable factor for learning. Later, when they gained experience, their attitude changed: the students stopped indicating control as a favourable factor for their use of OLE. The studies of R. Cerezo et al. (2015) indicate that the use of the flipped classroom causes increased students' self-control and individual regulation of learning [58]. They become responsible for their learning process [57,59]. At the same time, however, it demands more from students [56,60–62]. Therefore, students from our quasi-experiment indicated time planning and individual aspirations as more significant at the end of the study period. They started regarding personal qualities as more relevant than technological preparation. Hybrid learning allows students to regulate learning at their own pace and according to their own needs [63,64] and this allows them not only to understand the importance of their own decisions in learning but also to reduce the dependence on teacher control as well.

D. Garrote Rojas, J.A. Arenas Castillejo and J. Fernández (2018) indicate that teachers' computer literacy must be at a level that allows them to apply various methods of student activation in response to the set goals [65]. Teachers must be competent in the subject knowledge, pedagogical skills and technological know-how [66]. Our study showed that teachers' computer literacy was more important in the beginning of the studies. Having acquired experience in using OLE, students attached less importance to the teacher's computer literacy and more of them indicated their willingness and

motivation to use OLE as a favourable factor. Teachers who have more positive attitudes towards educational technologies feel more comfortable with using the technologies [67–71]. The teacher's competency and positive attitude are interrelated. T. Long, J. Cummins and M. Waugh (2017) found that in comparison to the traditional instructor-cantered, lecture-based model, the flipped classroom model required teachers to be better organised in instructional design before the beginning of the courses [17]. Our study revealed that teachers have to control students more in the beginning and give more responsibility to the students at the end of the course.

The results of our study can help teachers to prepare students for the course. Despite the intensive use of ICT in their leisure time, students experience anxiety and insecurity when faced with long-term use of OLE [72–75]. Therefore, proper teacher-student communication before the course could help students get ready to the intensive use of OLE and prepare for the challenges it poses. These insights should be tested in other contexts and with qualitative study to get more transferable results.

Digital technologies may contribute to the development of sustainable learning, and the awareness of students' opinion about favourable and unfavourable factors of using OLE may make this development more efficient. Institutions have to invest in the development of teachers' competences and to strive for teachers' positive attitudes towards OLE to ensure the sustainable development of online learning. According to Xiao et al., (2020) hybrid learning spaces compared with fully face-to-face or online learning environments are cost- and time-effective [25]. This sustainable tool of modern education has to develop simultaneously with pedagogical competences, because e-learning has a negative impact due to a lack of communication skill development and asynchronous digital content delivery [76,77].

5. Conclusions

The favourable factors of using online learning environment identified by students in the beginning of the quasi-experiment were divided into five categories: material resources/base; teacher personality; student personality, information presentation and increase of accessibility at the institutional level. Four categories coincided in the beginning of the educational project and at the end of it but in the beginning the students stressed the importance of increasing the accessibility of OLE at the institutional level, which was not referred to at the end of the project. At the end of the project the participants pointed out that the very conditions of using OLE were the most important to them, followed by the uploading of material to OLE and its convenience to use.

Both in the beginning of the project and at the end of it four unfavourable factors for using OLE were distinguished: student personality, teacher personality, organisational weaknesses and information characteristics. However, the change in students' attitude was observed after students used OLE. We can conclude that as students gain more experience in using OLE for learning, it is not technical issues and computer literacy that become important, but students' and teachers' attitudes and the motivation to improve and learn. The analysis of students' attitudes shows that motivation helps to overcome external distractions more easily. As students become more familiar with OLE, their resistance to using OLE decreases. Moreover, the importance of the role of the teacher as a mentor increases.

In the beginning of the educational project, the students stressed the importance of ensuring the accessibility of OLE at the institutional level, but at the end of it this category was not distinguished. At the end of the project, the students pointed to the very conditions of using OLE: continuous uploading of material to OLE, convenience of use and promoting the use of OLE learning all the study subjects, which were not distinguished in the beginning of the project.

The research allows us to assume that the beginning of the study is very important and has impact on the further study process. The more informative the start of studies, the calmer and more comfortable the students' further learning.

Clear instructions are needed for students at the beginning of their hybrid learning. The answers should be provided on how to connect to systems, how to use virtual tools, where to get help and how

studies in OLE will be evaluated. Students also have to be sure that the teacher's competence to work with OLE is sufficient. The importance of the interaction with the teacher stays is preserved all along the study semester. The teacher should take the time to identify the students' practical preparation (computer literacy, ability to study independently, etc.) at the beginning of the semester. Based on this information, the teacher can differentiate and individualise tasks, help with time planning, set goals to overcome challenges in the process of organising further learning.

Limitations. The article examines the transformation of informants' attitudes during one semester but does not examine the influence of various variables. This limitation definitely affects the sustainability of the findings. In order to refine the insights, it is worth exploring the influence of various factors, such as forms and frequency of teacher communication, student motivation or class attendance, students' individual learning experiences in other institutions and in other forms. Even though the participants represented a good mix of demographic characteristics, caution should be used in generalising the results to other populations and disciplines. The insights presented in the article are formulated only for the examined context of five student groups. It would make sense to extrapolate the study by expanding the target groups. Future studies would be beneficial from the perspective of the analysis of external and internal factors, as well as from that of other contexts (study programmes, universities). It would be particularly useful to analyse the change in the attitude of highly motivated students using purposeful sampling in the study.

Author Contributions: Conceptualisation, I.V. and Ž.S.-P.; methodology, formal analysis, I.V.; resources I.V. and Ž.S.-P.; data curation, I.V. and Ž.S.-P.; writing—original draft preparation, I.V. and Ž.S.-P.; writing—review and editing, Ž.S.-P.; visualisation, I.V. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

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